

MONTHLY NOTICES

OF THE

ROYAL ASTRONOMICAL SOCIETY.

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No. 6

W. H. MAW, Esq., PRESIDENT, in the Chair.

Rev. Walter Bristow, Hillam Road, Abbey Park Road,
Grimsby ;

Arthur Stanley Eddington, B.Sc., B.A., Royal Observatory,
Greenwich ; and

Dr. Edalji Manekji Modi, F.C.S., &c., Sleater Road, Bombay,

were balloted for and duly elected Fellows of the Society.

The following candidates were proposed for election as
Fellows of the Society, the names of the proposers from personal
knowledge being appended :—

John de Fenton, Ph.B., Secretary, Seymour Avenue, Park-
town, Johannesburg, South Africa (proposed by R. T. A.
Innes) ;

John Grigg, The Observatory, Thames, New Zealand (proposed
by W. Steadman Aldis) ; and

Robert Leetham Jones, M.A., Barrister-at-law, 3 King's
Bench Walk, Temple, E.C. (proposed by Fredk. W. Crowe).

Professor Julius Franz, Observatory, Breslau, Germany, was
proposed by the Council as an Associate of the Society.

Ninety-four presents were announced as having been received
since the last meeting, including, amongst others :—

G. W. Hill, collected mathematical works, vol. ii., presented
by the author ; Lowell Observatory Annals, vol. iii., presented
by Professor Lowell ; Telegraphic determinations of longitude,

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1888-1902, made under the direction of Sir W. H. M. Christie ; and eighteen charts of the Astrographic Chart of the Heavens, presented by the Royal Observatory, Greenwich ; two lantern slides of spectroheliographs of the Sun taken at Kodaikanal Observatory, presented by the Director ; six large transparencies from photographs of the Milky Way taken by Professor E. E. Barnard at Mount Wilson, California, presented by the Yerkes Observatory.

A Tentative Explanation of the Apparent Secular Acceleration of the Earth's Orbital Motion. By P. H. Cowell.

I have recently shown that, in order to satisfy the ancient eclipses of the Sun and Moon, it is necessary to assume that the mean longitude of the Moon contains a term $+11'' T^2$, and that the mean longitude of the Sun contains a term $+4'' T^2$.

These two arbitrary assumptions satisfied six solar eclipses. It was inconceivable that this could be a mere coincidence. Moreover, in the lunar eclipses of the *Almagest*, if we try to satisfy the records by assuming unknown secular accelerations for both Sun and Moon, we are led to precisely the same conclusions. I have felt it impossible to doubt that the records are trustworthy, and that no tables of the Sun and Moon will be completely satisfactory that fail to agree with those records.

There is still, however, some latitude of interpretation left. The eclipses determine at certain times the relative positions of the Sun, Moon, and node of the Moon's orbit. Two relations in fact exist between the four quantities, the position of the Sun, the position of the Moon, the position of the node, and the time.

The history of the subject is briefly as follows :

Halley discovered the secular acceleration of the Moon, Laplace showed that the changes produced by the planets in the eccentricity of the Earth's orbits would produce effects of the kind noted by Halley, Adams first correctly calculated the secular acceleration of the Moon's mean motion, and Professor Brown has given (*Monthly Notices*, lvii. p. 348) the following numerical values of the secular accelerations per century (measured from a fixed or uniformly moving departure point) :

For the mean motion	$+5.91''$
For the node	$+6.56''$

From the ancient eclipses I obtained as observed values of the secular terms :

For the distance from the Sun to the Moon	...	$+7''$
For the distance from the node to the Sun	...	$-2.4''$